

Memorandum

Date: September 17th 2014

To: Overlook Drive Preservation Alliance

From: Ronnie Williams, P.E.*, PTOE
Perry Ryan, P.E.**

Subject: Review of Dwan Estate Subdivision Traffic Study dated August 12th, 2014

1. Introduction

1.1. Purpose

The purpose of this memorandum is to provide a review of the August 12th 2014, Traffic Study of the Dwan Estate Subdivision provided by Bolton and Menk, Inc. The scope of this review is to determine if the following has been provided as outlined in the August 12th 2014 Traffic Study:

- A reasonable and comprehensive analysis to demonstrate how the new connection on Overlook Drive between Xerxes Avenue and France Avenue will affect traffic conditions for nearby residents and neighborhoods.
- A thorough investigation to determine how well the existing roadways, lane layout, and traffic control handle the current and future traffic loads with the addition of the new development.

1.2. Location

The proposed project site of the Dwan Estate Subdivision is located south the Dwan Golf Course in Bloomington, Minnesota. The development will connect Overlook Drive between Xerxes Avenue and France Avenue. This development includes the removal of a single residence and the addition of a 13-lot single family residential subdivision. Refer to Figure 1 and Appendix A in the August 12th 2014 Traffic Study for additional information.

1.3. Roadway Network and Functional Classification

Overlook Drive forms two dead end segments between France Avenue and Xerxes Avenue. The proposed connection of Overlook Drive would create a through street between France Avenue and Xerxes Avenue. The classification of west Overlook Drive and France is a major collector. The classification of east Overlook Drive and Xerxes is a minor collector. Both collectors are designated for an average traffic flow of 1,000 to 15,000 trips per day by the City of Bloomington 2008 Comprehensive Plan, Table 4.1 and Metropolitan Council Functional Classification System Criteria and Characteristics, Transportation Policy Plan Appendix D. The two deadends which will form the proposed through street are classified as a local street, and are designed for an average traffic flow of less than 1,000 trips per day.

Table A – Existing Functional Classification and Width

Street	Functional Classification*	Vehicles Carried Daily*	Existing Street Width
Overlook Drive (West of France)	Major Collector	1,000 – 15,000	44 ft
France	Major Collector	1,000 – 15,000	34 ft
Overlook Drive (East of Xerxes)	Minor Collector	1,000 – 15,000	34 ft
Xerxes	Minor Collector	1,000 – 15,000	38 ft
Overlook Drive (West Deadend Off France)	Local	Less than 1,000	34 ft
Overlook Drive (East Deadend Off Xerxes)	Local	Less than 1,000	26 ft

*Reference: City of Bloomington 2008 Comprehensive Plan, Table 4.1 and Metropolitan Council Functional Classification System Criteria and Characteristics, Transportation Policy Plan Appendix D

2. Traffic Forecasts

2.1. Trip Generation Rate for Development

Per Figure 5 and Tables 1, 2, and 3 from the August 12th 2014 Traffic Study, the existing trips in 2014 are 350 and will increase to 500 with the addition of the development in 2015. The trip generation for the development was determined using the Trip Generation Manual, 8th Edition, Institute of Transportation Engineers, 2008. It is noted the newest manual is the 9th addition; however the data did not change for single family homes.

2.2. Trip Distribution

The August 12th 2014 Traffic Study indicates the majority of traffic generally heads east/west on Old Shakopee Road and East on 106th Street to access I-35W. In addition to these collectors and expanders, other main expanders which need to be included in the analysis are north on France Avenue and north on Normandale Boulevard to access 494.

3. Traffic Operations Analysis

3.1. Level of Service

The Level of Service analysis was completed at the intersection of France Avenue & Overlook Drive and Xerxes Avenue and Overlook Drive, using the methodology of the 2010 Highway Capacity Manual through Synchro by Trafficware. Only the results were provided demonstrating a Level of Service D, which would be acceptable. However, the August 12th 2014 Traffic Study did not provide the analysis in the Appendix. It is unclear if the study used a combined Peak Hour Factor for each intersection or did it use a Peak Hour Factor for each approach. The Highway Capacity Manual recommends a combined Peak Hour Factor. The saturation flow rate used is unclear. Synchro uses 1,900 pc/hr/ln by default, but if the population is less than 250,000 it recommends using 1,750 pc/hr/ln. The lower saturation flow rate would impact the Level of Service. Additionally this analysis does not take into consideration the expected amount of cut-through traffic as outlined in Additional Considerations in this memorandum. Without additional information in the Appendix indicating the Synchro inputs, it is not possible to determine if the intersections in the study area are expected to operate within the acceptable LOS thresholds.

4. Additional Considerations

4.1. Travel Times

Figures 7 through 14 of the August 12th 2014 Traffic Study show calculated travel times along different routes assuming Overlook Drive is connected. All segments assume a speed of 30 mph and delays at intersections are based off of field measurements and traffic modeling results. It is unclear in the August 12th 2014 Traffic Study what these delays were for intersection control, whether if any of the routes were actually driven to verify estimated calculations, or if the delays in the timed studies were done during peak rush hour traffic when highest potential for reroute through the Overlook Drive connection would occur.

4.2. Travel Times Calculated Do Not Correlate with Rerouting Potential in Tables 7 and 8

Per the August 12th 2014 Traffic Study it indicates the volume distribution of the re-route to Overlook Drive is based on the number of routes available with essentially equal travel times and assumes an equal split between each route. However the potential cut-through traffic is not split equally between each route in the tables as indicated in the analysis. As shown in Figure B traffic is equally divided returning from Old Shakopee Road to the intersection of France Ave and Overlook Drive, therefore there is a 50% potential for rerouting of traffic through the Overlook Drive connection. Additionally, there is a 60% potential for rerouting

traffic through the Overlook Drive connection from the France Avenue and Overlook Drive intersection to 110th Street heading east to 35W. As shown in Table 8 below from the August 12th 2014 Traffic Study a percentage reroute of 33% and 24% were used with no additional explanation. If the purpose is to determine how the new Overlook Drive connection will effect traffic conditions for nearby residents and neighborhoods, the conservative values of 50% and 60% reroute would be more appropriate.

Table 8: Re-Routing Potential Version 2

Potential Route Changes with Overlook Drive Connection				
Cordon Line	Version 2: Cordon North of Old Shakopee Rd			
AADT on France, North of Overlook Dr.			1100	
Route	AADT	% of AADT	France Using Each Route	Could Use Overlook Dr Instead
West on Old Shak	0	0%	0	Assumes none of the traffic is destined to/from the West
North on Norm	0	0%	0	
North on France	12000	24%	263	
North on Xerxes	2350	5%	51	9
East on Old Shak	24850	50%	545	182 273
East on 106th	11000	22%	241	58 145
Total	50200	100%	1100	248 418

Per Time Study

50%

60%

Current Estimate 33%
24%

4.3. The Actual Traffic Counts Collected Were Not Used in Table 7 and 8

As indicated on page 2 of the August 12th 2014 Traffic Study, 24-hour ADT counts were collected on France Avenue between Overlook Drive and 110th Street on July 8th and 9th 2014. The results are shown in Figure 5 of the Traffic Study. Per this figure the expected traffic flow at the France Avenue and Overlook Drive intersection is 1,800 trips, however a lesser value of 1,100 trips was used in calculating the reroute potential above in Table 8. If 1,800 trips are taken into consideration, with the conservative time study results, this increases the potential reroute through the Overlook Drive connection to 681 trips. Additionally, the 1,800 trips should be considered a low count as it was taken during the summer when school is out right after a major holiday.

4.4. The effect of restriping 106th street from 4-lane to 2-lanes was not taken into account

The August 12th 2014 Traffic Study utilized recent AADT traffic flow information which was collected prior to the restriping of 106th street between Xerxes Ave and Morgan Ave. Unlike similar streets such as 86th street which were recently restriped, 106th carries twice as much traffic per the MN Dot AADT Traffic Data. The effects the restriping were not taken into consideration, as commuters may use the Overlook Drive connection to provide a quicker and more direct route to 106th street and bypass the congestion.

4.5. Trips generated from the southeast neighborhood were not taken into consideration

The August 12th 2014 Traffic Study only investigated the potential cut-through traffic originating at the intersection of France Avenue and Overlook Drive with a final destination east on Old Shakopee Road or east on 106th Street. The study did not explore the potential commuter traffic in the southeast neighborhood which could use the Overlook Drive connection to access Normandale Boulevard. Based on the number homes using Overlook Drive as their main collector and an ITE Trip Rate of 9.57, an estimated 1,370 trips are generated in the southeast neighborhood. Using the Cordon Line method established in the August 12th 2014 Traffic Study, the cut-through traffic volume can be estimated at 448 trips as indicated in Figure C.

It should be noted the Xerxes Avenue & Overlook Drive intersection is a t-intersection, so by design the southbound approach of Xerxes Avenue yields to the east/west traffic on Overlook Drive. A yield sign exists on the southbound Xerxes Avenue providing further clarification of vehicle right of way. Thereby traffic head to and from the Overlook Drive connection from the southeast neighborhood is not required to yield to traffic.

4.6. Trips generated from the southwest neighborhood were not taken into consideration

The August 12th 2014 Traffic Study did not explore the potential commuter traffic in the southwest neighborhood from Normandale Boulevard to France Avenue which could use the Overlook Drive connection whose final destination is east on Old Shakopee Road or east on 106th Street. Based on the number homes using Overlook Drive as their main collector and an ITE Trip Rate of 9.57, an estimated 4,370 trips are generated in the southwest neighborhood. Using the Cordon Line method established in the August 12th 2014 Traffic Study, the cut-through traffic volume can be estimated at 928 trips as indicated in Figure D.

4.7. Auto Club Road reroute was not taken into consideration

The August 12th 2014 Traffic Study did not explore the effects of congestion on Old Shakopee Road due to traffic control, and the potential for commuters from Auto Club Road to use the Overlook Drive Connection as a less congested commuter route to 106th street. As shown in Figure E, the AADT on Auto Club Road is 6,700 trips. Using the Cordon Line method established in the August 12th 2014 Traffic Study, the cut-through traffic volume can be estimated at 538 trips.

5. Conclusions

After the development of the Dwan Estates Residential Subdivision, the August 12th 2014 Traffic Study estimates the traffic on Overlook Drive connection not to exceed 750 trips. It is felt this is an underestimation for the following reasons:

- Travel times calculated do not correlate with rerouting potential in Tables 7 and 8.
- The actual traffic counts collected on France Avenue were not used in the reroute potential in Tables 7 and 8.
- The effect of restriping 106th street from 4-lane to 2-lanes was not taken into account.
- Rerouting of trips generated from the southeast neighborhood through the Overlook Drive connection were not taken into consideration.
- Rerouting of trips generated from the southwest neighborhood through the Overlook Drive connection were not taken into consideration.
- Auto Club Road reroute through the Overlook Drive connection due to congestion on Old Shakopee Road was not taken into consideration.

Taking the above into consideration and using the methodology established in the August 12th 2014 Traffic Study, the potential for trip rerouting through the Overlook Drive connection could exceed 2,400 trips. Thereby exceeding the existing functional classification of this local road as outlined in the City of Bloomington 2008 Comprehensive Plan.

Due to the large number of variables, Travel Demand Modeling would be necessary to acquire a closer estimation of the potential reroute through the Overlook Drive Connection. The Travel Demand Modeling would take into consideration socioeconomic factors to determine trip generation, trip distribution based on entropy maximizing modeling, and route assignment taking into account travel times, road congestion, fuel costs, etc. It is believe Travel Demand Modeling could potentially demonstrate the total estimated trips on the Overlook Drive Connection will be in excess of the 750 trips estimated in the August 12th 2014 Traffic Study.

Due to the high potential of a substantial increase in traffic on the Overlook Drive connection the implementation of traffic calming measures are recommended as part of this development. Roundabouts at each end of the Overlook Drive connection, speed bumps, and narrower drive lanes such as 11 ft for a total road width of 22 ft should be implemented to serve as speed calming mechanisms to reduce speeds and traffic volumes.

6. Appendix

Figure A – Function Classification

Figure B – Reroute Potential through Overlook Drive Connection

Figure C – Cordon Line to Estimate Reroute Potential from Southeast Neighborhood

Figure D - Cordon Line to Estimate Reroute Potential from Southwest Neighborhood

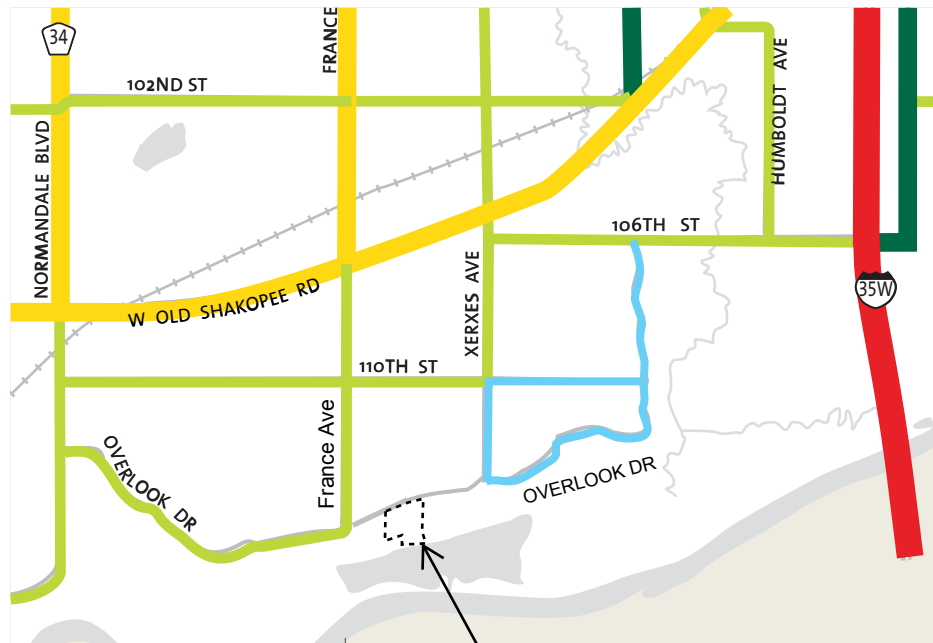
Figure E - Cordon Line to Estimate Reroute Potential from Auto Club Road

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: Perry Ryan

Signature: 

Date: 9/17/14 License #: 22071



Proposed Dwan Estates
Development Location

Metropolitan Level

- Principal Arterial
- "A" Minor Arterial
- Reliever
- Expander

Municipal Level

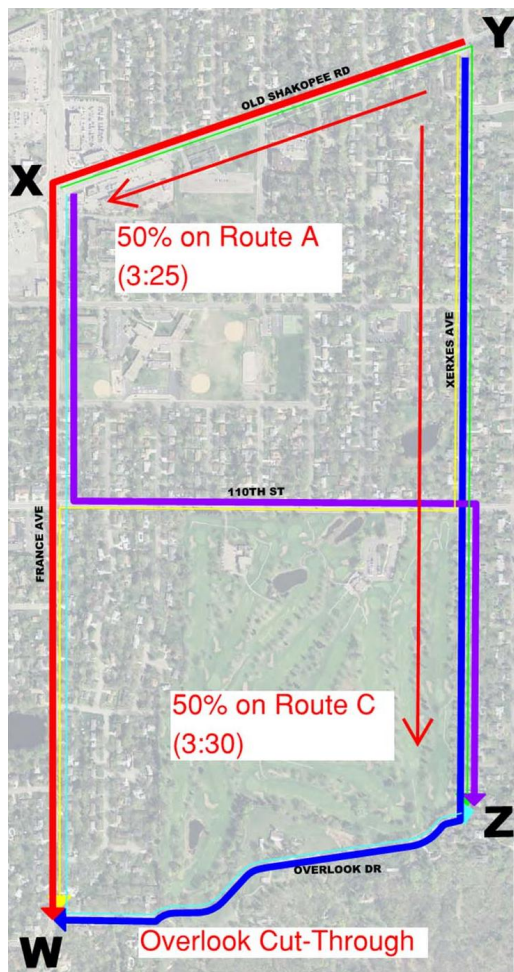
- "B" Minor Arterial
- Collector
- Major
- Minor

Dwan Estate Subdivision

Traffic Study Review

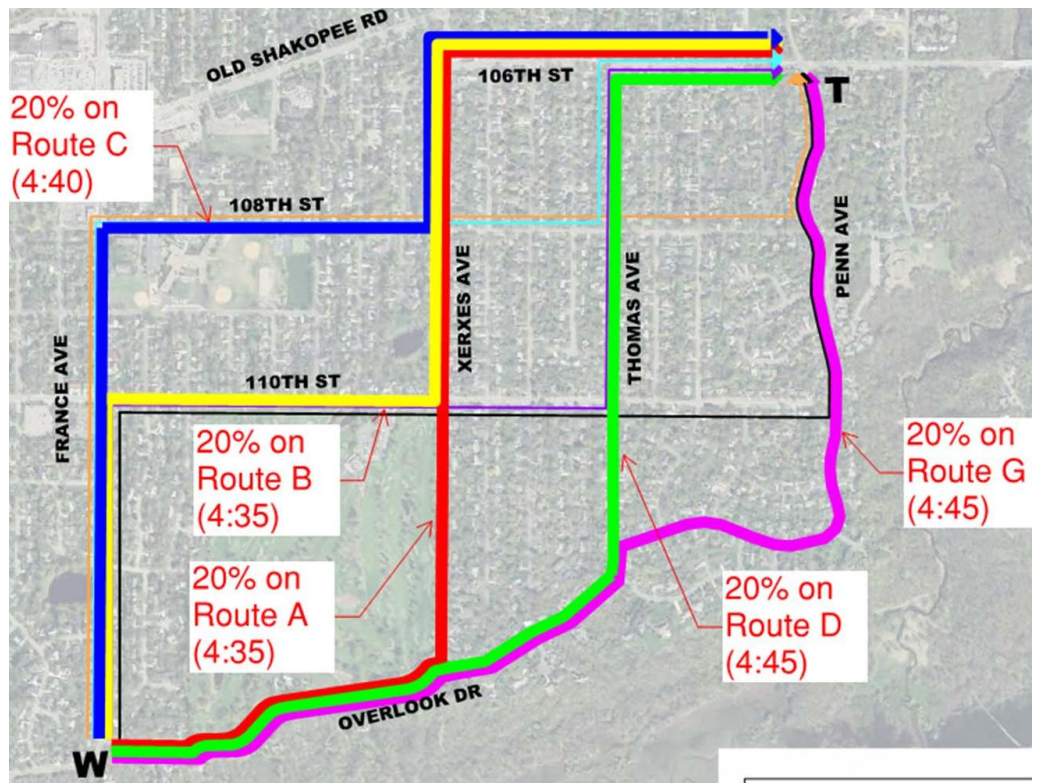
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Figure A - Functional Classification



Taken from Figure 8 of the August 12th Traffic Study. Percents have been added for clarification

Taken from Figure 11 of the August 12th Traffic Study. Percents have been added for clarification



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Figure B - Reroute Potential Through Overlook Drive Connection



Potential Route changes with Overlook Drive Connection

Cordon Line

Version 3: Cordon NW of 110th street

Trips Originating SE of Overlook Connection

1370

Route	AADT	% of AADT	Trip Originating SE of Overlook Connection	Could Use Overlook Dr Instead
West on 110th	4200	27%	365	183
North on France	6100	39%	531	265
North on Xerxes	2300	15%	200	0
North on Thomas	1100	7%	96	0
North on Penn	2050	13%	178	0
Total	15750	100%	1370	448

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Figure C - Cordon Line to Estimate Reroute Potential from Southeast Neighborhood



Potential Route changes with Overlook Drive Connection

Cordon Line

Version 4: Cordon W-N-E of Old Shakopee

Trips Originating SW of Overlook Connection

4370

Route	AADT	% of AADT	Trip Originating SE of Overlook Connection	Could Use Overlook Dr Instead
West on Old Shak	28000	31%	1365	0
North on Norm	13800	15%	673	0
North on France	12000	13%	585	0
East on Old Shak	24850	28%	1211	606
East on 106th	11000	12%	536	322
Total	89650	100%	4370	927

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Figure D - Cordon Line to Estimate Reroute Potential from Southwest Neighborhood

